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09/673,479	10/16/2000	Nobuaki Hashimoto	107280	6925

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EXAMINER

GRAYBILL, DAVID E

ART UNIT	PAPER NUMBER
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2827

DATE MAILED: 11/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Applicati n No.

09/673,479

Applicant(s)

HASHIMOTO, NOBUAKI

Examiner

David E Graybill

Art Unit

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-- The MAILING DATE of this communication appears on the cov r sheet with the corr spondenc address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, every feature of claims 1-28 must be shown or the features canceled from the claims. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

To determine adequacy of written description MPEP  
2163IIA2(a) (redacted) instructs:

(i) For Each Claim Drawn to a Single Embodiment Or Species:

(A) Determine whether the application describes an actual reduction to practice of the claimed invention.

(B) If the application does not describe an actual reduction to practice, determine whether the invention is complete as evidenced by a reduction to drawings or structural chemical formulas that are sufficiently detailed to show that applicant was in possession of the claimed invention as a whole.

(C) If the application does not describe an actual reduction to practice or reduction to drawings or structural chemical formula as discussed above, determine whether the invention has been set forth in terms of distinguishing identifying characteristics as evidenced by other descriptions of the invention that are sufficiently detailed to show that applicant was in possession of the claimed invention.

(1) Determine whether the application as filed describes the complete structure (or acts of a process) of the claimed invention as a whole.

(2) If the application as filed does not disclose the complete structure (or acts of a process) of the claimed invention as a whole, determine whether the specification discloses other relevant identifying characteristics sufficient to describe the claimed invention in such full, clear, concise, and exact terms that a skilled artisan would recognize applicant was in possession of the claimed invention. Any claim to a species that does not meet the test described under at least one of (a), (b), or (c) must be rejected as lacking adequate written description under 35 U.S.C. 112, para. 1.

ii) For each claim drawn to a genus:

The written description requirement for a claimed genus may be satisfied through sufficient description of a representative number of species by actual reduction to practice (see i) (A), above), reduction to drawings (see i) (B), above), or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination

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of such identifying characteristics, sufficient to show the applicant was in possession of the claimed genus (see i)(C), above).

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-28 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention.

The undescribed subject matter of the claimed invention is the entirety of the claims.

The instant application does not describe sufficient description of a representative number of species by actual reduction to practice, reduction to drawings, or by disclosure of relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such

identifying characteristics, sufficient to show the applicant was in possession of the claimed genera.

Claims 1-28 are rejected under 35 U.S.C. 112, first paragraph, because the specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make or use the invention commensurate in scope with these claims.

Specifically, the specification does not reasonably provide enablement for the genera of claims 1-4, 7, 11, 14-23 and 25-28. The claimed genera are not enabled because the binder is claimed in terms of its properties and functions, and there is no disclosed or otherwise known correlation or relationship between the properties and functions of the binder genera and the binder composition or structure. To further clarify, there is no disclosure that the claimed properties and functions define a particular binder composition species or genus. In addition, the invention involves unpredictable chemical reactions, and absent a statement applicable to the genera as a whole, it is indeterminable from the disclosure of the particular species what other species will work; hence, it is indeterminable what other species are members of the genera. As a result, a person skilled in the art could not make the binder genera as a whole without undue experimentation. Chemical reactivity is a most

unpredictable and empirical art and it is well settled that the requirement that the claims be commensurate in scope with the enabling disclosure is particularly stringent in this area of technology. In re Doumani 126 USPQ 408, In re Grant 134 USPQ 248, In re Fisher 166 USPQ 18, Mobil Oil Corporation v. W. R. Grace and Company 180 USPQ 418, In re Slocombe 184 USPQ 740, In re Mercier 185 USPQ 774, Corona Cord Tire Company v. Dovan Chemical Corporation 192 CD 255, See In re Hawkins 174 USPQ 157 (pg. 163) reasoning is sufficient, evidence is not required.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 5, 6, 8, 12, 13 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 5, 6, 12 and 13 the scope of the term "silica-based filler" is unclear because there is no art recognized definition of the term, and it is not otherwise explicitly defined in the disclosure.

In claims 6 and 13 the scope of the term "mixing ratio" is unclear because there is no art recognized definition of the

term, and it is not otherwise explicitly defined in the disclosure.

In claim 8 the scope of the term "metamorphic epoxy" is unclear because there is no art recognized definition of the term, and it is not otherwise explicitly defined in the disclosure.

In claim 25 the term "elastic modulus of" appears to be grammatically incorrect; hence, the scope of the term is unclear.

In the rejections infra, reference labels are generally recited only for the first recitation of identical elements.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 10, 11, 14-17 and 20-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsukagoshi (5120665).

At column 5, line 56 to column 6, line 5; column 7, lines 8-11; column 11, line 62 to column 13, line 30; column 14, lines 25-65; column 17, lines 11-21; and column 20, line 51 to column 21, line 33, Tsukagoshi teaches the following:

A binder "double layer film" used for bonding electronic components 11, 14, a physical property of the binder being different in a thickness direction thereof in a state where the binder is bonded with at least the electronic components, wherein the binder is an anisotropic conductive film, wherein the binder forms a two-layer structure comprising a first layer 16 formed of a first resin "Bylon 300" as a base material, and a second layer 18 formed of a second resin "Epikote 828" as a base material, the first resin and the second resin inherently having different physical properties in a state where the binder is bonded with at least the electronic components, wherein conductive particles are dispersed only in the second resin, wherein the conductive particles are dispersed only in the second resin, and the second layer is thinner than the first layer, and the second resin has higher viscosity than the first resin when melted, and wherein a molecular weight of the second resin is greater than a molecular weight of the first resin.

A semiconductor device comprising: a semiconductor chip 11; a substrate 14 on which a interconnecting pattern 15 is formed; and a binder electrically connecting the semiconductor chip and the interconnecting pattern, wherein the binder inherently differs in a coefficient of thermal expansion or an elastic modulus in a thickness direction thereof, wherein the binder is



an anisotropic conductive film, wherein the binder forms a two-layer structure comprising a first layer 16 formed of a first resin as a base material and disposed on a side of the semiconductor chip, and a second layer 18 formed of a second resin as a base material and disposed on a side of the substrate, and the first resin and the second resin having different physical properties.

Electronic equipment 11, comprising the semiconductor device as defined in claim 15.

A method of manufacturing a semiconductor device, comprising a step of providing a binder having a multilayer structure, between a semiconductor chip and a interconnecting pattern of a substrate on which is formed the interconnecting pattern, pressing the semiconductor chip and the substrate, and electrically connecting the semiconductor chip and the interconnecting pattern, wherein a physical property of each layer of the binder having the multilayer structure is different from one another, wherein the binder is an anisotropic conductive film, wherein the binder forms a two-layer structure comprising a first layer 18 formed of a first resin "Bylon 300" as a base material, and a second layer 16 formed of a second resin "Epikote 1002" inherently having a different coefficient of thermal expansion or an elastic modulus from the first resin

as a base material, and wherein the second layer is formed after the first layer.

A method of manufacturing a semiconductor device, comprising a step of providing a binder between a semiconductor chip and a interconnecting pattern of a substrate on which is formed the interconnecting pattern, pressing the semiconductor chip and the substrate, and electrically connecting the semiconductor chip and the interconnecting pattern, wherein the binder comprises a first layer 16 formed of a first resin "Epikote 1002" as a base material, and a second layer 18 formed of a second resin "Bylon 300" as a base material, the second resin differing from the first resin in at least one of a coefficient of thermal expansion and an elastic modulus of, and wherein the first layer is disposed on a side of the semiconductor chip, and the second layer is disposed on a side of the substrate, wherein at least one of the first layer and the second layer is an anisotropic conductive film, and wherein the binder is the binder as defined in claim 10.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at

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the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukagoshi as applied to claim 3, and further in combination with Date (JP09227849).

Tsukagoshi teaches wherein the first resin is a metamorphic epoxy resin.

However, Tsukagoshi does not appear to explicitly teach, wherein the second resin is made lower in elastic modulus than the first resin, and wherein the second resin is a biphenyl resin.

Nonetheless, in the English abstract and figures, Date teaches an anisotropic conductive binder comprising a biphenyl resin. Moreover, it would have been obvious to use the biphenyl resin of Date as the second resin of Tsukagoshi because it would provide an anisotropic conductive binder with desirable reliability.

In addition, in the specification, page 4, lines 11-15, applicant confirms that the second resin is inherently made lower in elastic modulus than the first resin when, as in the invention of the combination of Tsukagoshi and Date, a first resin is an epoxy resin and a second resin is a biphenyl resin.

Claims 1-3 and 15-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Ozawa (JP05013119).

In the English abstract, translation, and figures, Ozawa teaches the following:

A binder 11 used for bonding electronic components 21, 2 a physical property of the binder being different in a thickness direction thereof in a state where the binder is bonded with at least the electronic components, wherein the binder is an anisotropic conductive film, wherein the binder forms a two-layer structure comprising a first layer 14 formed of a first resin as a base material, and a second layer 12 formed of a second resin as a base material, the first resin and the second resin having different physical properties in a state where the binder is bonded with at least the electronic components.

A semiconductor device comprising: a semiconductor chip 21; a substrate 2 on which a interconnecting pattern 3 is formed; and a binder electrically connecting the semiconductor chip and the interconnecting pattern, wherein the binder inherently differs in a coefficient of thermal expansion or an elastic modulus in a thickness direction thereof, wherein the binder is an anisotropic conductive film, wherein the binder forms a two-layer structure comprising a first layer formed of a first resin as a base material and disposed on a side of the semiconductor

chip, and a second layer formed of a second resin as a base material and disposed on a side of the substrate, the first resin and the second resin having different physical properties.

Claims 4, 5 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ozawa as applied to claims 3 and 17, and further in combination with Kaneda (6223429).

As cited, Ozawa teaches wherein an insulating filler 15 is mixed only in the first resin.

However, Ozawa does not appear to explicitly teach a silica-based filler.

Nevertheless, at column 5, lines 16-22, and column 6, line 48 to column 7, line 4, Kaneda teaches a silica insulating filler. In addition, it would have been obvious to combine the teachings of Kaneda and Ozawa such that the filler of Ozawa is silica, because it would provide the insulating filler of Ozawa.

Further, in the specification, page 3, lines 19-25, applicant confirms that the coefficient of thermal expansion of a first resin is smaller than a coefficient of thermal expansion of a second resin when, as in the invention of the combination of Ozawa and Kaneda, a mixing ratio of a silica-based filler in the first resin is greater than a mixing ratio of a silica-based filler in the second resin.

Also, the combination of Ozawa and Kaneda teaches the semiconductor device as defined in claim 17 wherein the binder is the binder as defined in claim 4.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Ozawa and Kaneda as applied to claim 4, and further in combination with Tsukagoshi (6034331).

Although, as cited, the combination of Ozawa and Kaneda teaches a mixing ratio of the silica-based filler in the first resin is greater than a mixing ratio of the silica-based filler in the second resin, the combination does not appear to explicitly teach wherein the silica-based filler is mixed in the first resin and the second resin.

Regardless, at column 22, lines 34-41 and 56-63, Tsukagoshi '331 teaches a silica-based filler mixed in a first resin 2 and a second anisotropic conductive resin 1. Additionally, it would have been obvious to combine the teachings of Tsukagoshi, Ozawa and Kaneda because it would improve the resolution of the anisotropic conductivity of the second resin

Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukagoshi as applied to claim 11, and further in combination with Tsukagoshi (6034331).

Tsukagoshi '665 does not appear to explicitly teach wherein a silica-based filler is mixed only in the second resin.

However, at column 5, lines 56-63, and column 7, lines 8-11, Tsukagoshi '665 teaches a silica filler mixed in the second resin.

In addition, at column 22, lines 34-41 and 55-62, Tsukagoshi '331 teaches wherein an insulating filler is mixed only in a second anisotropic conductive resin 1. Furthermore, it would have been obvious to combine the teachings of Tsukagoshi '331 and Tsukagoshi '665 such that the insulating silica filler of Tsukagoshi '665 is mixed only in the second resin because it would enable the second resin to have higher viscosity than the first resin when melted, and it would improve the resolution of the anisotropic conductivity of the second resin.

Also, Tsukagoshi '665 teaches that a mixing ratio of the silica filler in the second resin is greater than a mixing ratio of the silica filler in the first insulating resin.

However, Tsukagoshi '665 does not appear to explicitly teach wherein the silica-based filler is mixed in the first resin and the second resin.

Notwithstanding, at column 22, lines 47-51, Tsukagoshi '331 teaches that a silica-based filler is mixed in a first resin and

a second anisotropic conductive resin. Furthermore, it would have been obvious to combine the teachings of Tsukagoshi '331 and Tsukagoshi '665 because it would provide a first insulating resin, and improve the resolution of the anisotropic conductivity of the second resin.

Claim 19 is rejected under 35 U.S.C. 102(a) as being anticipated by well known prior art.

Official notice is taken that a circuit board is well known prior art. Moreover, the limitation, "on which the semiconductor device as defined in claim 15 is mounted," is a statement of intended use of the board which does not result in a structural difference between the claimed circuit board and the well known circuit board. Further, because the well known board has the same structure as the claimed board, it is inherently capable of being used for the intended use, and the statement of intended use does not patentably distinguish the claimed board from the well known board. Similarly, the manner in which a product operates is not germane to the issue of patentability of the product; Ex parte Wikdahl 10 USPQ 2d 1546, 1548 (BPAI 1989); Ex parte McCullough 7 USPQ 2d 1889, 1891 (BPAI 1988); In re Finsterwalder 168 USPQ 530 (CCPA 1971); In re Casey 152 USPQ 235, 238 (CCPA 1967). Also, "Expressions relating the apparatus to contents thereof during an intended operation are



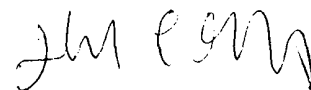
of no significance in determining patentability of the apparatus claim."; Ex parte Thibault, 164 USPQ 666, 667 (Bd. App. 1969). And, "Inclusion of material or article worked upon by a structure being claimed does not impart patentability to the claims."; In re Young, 25 USPQ 69 (CCPA 1935) (as restated in In re Otto, 136 USPQ 458, 459 (CCPA 1963)). And, claims directed to product must be distinguished from the prior art in terms of structure rather than function. In re Danley, 120 USPQ 528, 531 (CCPA 1959). "Apparatus claims cover what a device is, not what a device does [or is intended to do]." Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990).

The art made of record and not applied to the rejection is considered pertinent to applicant's disclosure. It is cited primarily to show inventions similar to the instant invention.

*Any telephone inquiry of a general nature or relating to the status (MPEP 203.08) of this application or proceeding should be directed to Group 2800 Customer Service whose telephone number is 703-306-3329.*

Any telephone inquiry concerning this communication or earlier communications from the examiner should be directed to David E. Graybill at (703) 308-2947. Regular office hours: Monday through Friday, 8:30 a.m. to 6:00 p.m.

The fax phone number for group 2800 is (703) 872-9306.



David E. Graybill

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Primary Examiner  
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D.G.  
28-Oct-03